

AMENDMENTS TO THE CLAIMS

1. (Currently amended) A method for configuring an aircraft for low sonic boom supersonic flight conditions comprising:

in a computer system:

scaling an equivalent area distribution curve of the aircraft to approximate an ideal equivalent area distribution goal curve; and

relaxing a design constraint ~~that~~ ~~to~~ requires the equivalent area distribution curve of the aircraft to be less than or equal to (\leq) at or below the equivalent area distribution goal curve instead of equal ($=$) to the equivalent area distribution curve.

2. (Original) The method according to Claim 1 further comprising:

segmenting a wing of the aircraft into panels;

analyzing the flow characteristics for each panel; and

smoothing the configuration of each panel with adjacent panels along the span and the chord of the wing to smooth the wing surface.

3. (Original) The method according to Claim 1 further comprising:

determining design variables at the root and the tip of a wing of the aircraft along Mach angle lines ($X - \text{Beta} \cdot R$).

4. (Original) The method according to Claim 1 further comprising:

determining an incidence angle for a wing root of the aircraft for maximum lift-to-drag and connection to a fuselage; and

determining the shape of the remaining portions of the wing for maximum lift-to-drag.

5. (Original) The method according to Claim 4 further comprising:

re-determining the incidence angle for the root of a wing of the aircraft and the

remaining portion of the wing to meet less than or equal to equivalent area low sonic boom constraints and maximum lift-to-drag.

6. (Original) The method according to Claim 1 further comprising:
dividing a flight regime of the aircraft into multiple flight modes;
determining an optimum configuration of non-moving components for one of the
flight modes; and
determining an optimum configuration of moving components for the other flight
modes based on the configuration of non-moving components.
7. (Original) The method according to Claim 1 further comprising:
determining an optimum configuration according to at least one of: lift-to-drag ratio
and low sonic boom.
8. (Original) The method according to Claim 3 further comprising:
limiting the length of the excursion of the equivalent area distribution curve below the
equivalent area distribution goal curve by dividing the excursion into at least
two smaller excursions.
9. (Original) The method according to Claim 1 further comprising:
determining a minimized sonic boom disturbance of an F-function; and
scaling the equivalent area distribution goal curve to maintain the desired aircraft
weight while countering excursions below the equivalent area distribution goal
curve.
10. (Original) The method according to Claim 3 further comprising:
analyzing the sonic boom disturbance below and to the side of the aircraft; and
perturbing aircraft design variables to meet sonic boom constraints below and to the
side of the aircraft.
11. (Original) The method according to Claim 1 further comprising:
adjusting the configuration of a wing on the aircraft to redistribute areas of lift on the
wing; and
reshaping a fuselage of the aircraft in combination with the wing to match the
equivalent area distribution goal curve.

12. (Original) The method according to Claim 11 further comprising:
redistributing the areas of lift subject to center-of-pressure constraints to achieve
desired balance characteristics for the aircraft.

13-28. (Canceled)

29. (Currently amended) A method for configuring an aircraft for supersonic flight
with low shock wave disturbance constraints comprising:

in a computer system:

redistributing lift of a wing by configuring the wing with areas of far-field
expansion ahead of areas of far-field compression; and
scaling an equivalent area distribution goal curve to maintain the desired
aircraft weight while countering excursions below the equivalent area
distribution goal curve.

30. (Currently amended) The method according to Claim 29 further comprising:
segmenting the wing into panels;
analyzing the flow characteristics for each panel; and
interpolating the configuration of each panel with adjacent panels to smooth
oscillations in the wing surface chordwise, and spanwise along Mach angle
lines.

31. (Previously presented) The method according to Claim 29 further comprising:
analyzing perturbations of design variables at the root and the tip of the wing along
Mach angle lines.

32. (Previously presented) The method according to Claim 29 further comprising:
analyzing perturbations of design variables along a mid-section portion of the wing.

33. (Previously presented) The method according to Claim 29 further comprising:
determining an incidence angle for the wing for maximum lift-to-drag; and

determining the shape of the remaining portions of the wing for maximum lift-to-drag;
and
re-determining the incidence angle and shape of the wing to also meet low sonic boom constraints.

34. (Previously presented) The method according to Claim 29 further comprising:
redistributing the lift of the wing with center-of-pressure constraints for aircraft
balance.

35. (Previously presented) The method according to Claim 29 further comprising:
dividing a flight regime of the aircraft into multiple flight modes;
determining an optimum configuration according to sonic boom constraints at a flight
condition; and
determining another optimum configuration to minimize drag at another flight
condition subject to sonic boom constraints.

36. (Previously presented) The method according to Claim 29 further comprising:
dividing the areas of far-field expansion and far-field compression into at least two
areas of expansion and compression to reduce the magnitude of the sonic boom
disturbance.

37. (Previously presented) The method according to Claim 29 further comprising:
determining a desired magnitude of sonic boom disturbance on an F-function; and
scaling the equivalent area distribution goal curve to maintain the desired aircraft
weight while countering excursions below the equivalent area distribution goal
to achieve the desired magnitude of sonic boom disturbance.

38. (Previously presented) The method according to Claim 29 further comprising:
analyzing the sonic boom disturbance below and to the side of the aircraft; and
configuring the aircraft to meet sonic boom constraints below and to the side of the
aircraft.

39. (Previously presented) The method according to Claim 29 further comprising:
allowing the user to define a design variable with limits that allow variation in the
incidence angle of the wing where the wing joins the aircraft within a range
that allows the wing to be connected to the aircraft.